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INTRICATAE

Crataegus biltmoreana Beadle. (*C. glandulosa* Pursh, not Michaux ;
C. modesta Sarg., *C. premora* Ashe.)

Coleman's, Moore's Mills ; Dykeman's, Putnam Co.; Bedford,
 Westchester Co.; New York Bot. Garden ; Woodlawn, New
 York City, *Bicknell* ; Fort Lee, N. J., *Curtis*.

Crataegus Boyntoni Beadle. (*C. coccinea* ? Britton, *C. foetida*
 Ashe, *C. Baxteri* Sarg.)

Coleman's, Moore's Mills, Clove Branch ; Dykeman's, Putnam
 Co.; Bedford, Westchester Co.; Harlem River, Riverdale, and
 Ft. Washington, *Bicknell* ; Persimmon Island, New Rochelle,
Day ; Ft. Lee, N. J., *Curtis*.

Crataegus intricata Lange.

Coleman's, Moore's Mills.

Crataegus.

No. 6a, Coleman's.

TOMENTOSAE

Crataegus macracantha Lodd. (*C. ferentaria* Sarg.)

Coleman's, Moore's Mills, and Clove Branch.

A set of these thorns is deposited in the herbarium of the
 Torrey Club.

NEW YORK BOTANICAL GARDEN.

A CAUSE OF FREAK PEAS

BY J. M. VAN HOOK

After two years experimenting in the study and control of pea-
 blight * due to the fungus *Ascochyta Pisi* Lib., in which the ger-
 mination of the diseased seed has been a part of the work, thou-
 sands of diseased seedling-peas have been observed. One *cause*
 for abnormal growth might be of interest to those whose atten-
 tion has been called to freak peas by Clendenin † in the March
 number of *TORREYA* of last year.

* Bull. 173, Ohio, Agr. Exp. Sta. 1906.

† Clendenin, Ida. Other Freaks of Peas. *TORREYA*, 5 : 41-42. 1905.

The fungus attacks not only the growing pea-stems and leaves, but also the pods and thence may grow into the seed. Many peas which show no discoloration are infected. Consequently,



FIG. 1. *a*, pea seedling attacked by *Ascochyta*; lesion on side of stem; *b*, primary and secondary stems killed at tip by fungus; a fifth stem just starting; *c*, primary stem killed above; a branch and the buds in the axils of the two cotyledons developing; one of the latter killed at the tip.

when such peas are planted, the fungus immediately develops and rots the peas, thus reducing the per cent. of germination. Of those peas which do germinate, many do not get through the ground. In other cases, the pea comes up only to be attacked later by the fungus, which either kills or injures the stem near the growing tip or produces lesions on the stem. Fig. 1, *a*, shows such a lesion a little more than half way up the stem. It is not always necessary for the terminal bud or the stem to be *killed* in order to produce development of the axillary buds at the base of stem, as a very slight lesion on the side of the stem often suffices. Scores of such cases have been observed where the primary stem seemed still healthy. Furthermore, not only do the buds in the axils of the two cotyledons develop, but other adventitious shoots appear from the same region. These may either appear when the disease attacks the secondary shoots or at the same time as those from the axils of the cotyledons. Frequently as many as six shoots developed when the primary stem was injured. Fig. 1, *b*, shows three secondary stems; these, in turn were all killed by the fungus at the tip and a fourth shoot was just starting.

Sometimes considerable difficulty is experienced in obtaining good germination with peas for botany classes. In view of the failure to grow because of the blight fungus, as well as from other fungi and bacteria, it is suggested that all discolored peas be thrown out; that the soil be sterilized or a new or less organic soil be substituted; and that the soil should not be kept too wet. Seed treatment before planting by the use of heat or chemicals has proved a failure, since the fungus is *within* the pea seed and anything used as a fungicide kills the pea germ before it kills the fungus.

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